



Socio-Economic Characteristics

The status of the people and communities within forest and rangelands is integral to any comprehensive assessment of these areas. As California's population and economy grow, the character of rural and urban areas will continue to change. Overall, both the populations and economies of forest and rangeland counties are growing and diversifying.

In addition to the demographic and employment changes, it is important to consider the well being of individuals, households, and communities in California's forests and rangelands. Changes in overall demographic and employment patterns may not capture changes in the factors important to residents regarding their community.

Socio-economic characteristics evaluate such things as income opportunities, poverty levels, educational quality, public safety, involvement in local civic groups, and aspects of a clean and enjoyable environment.

recurring themes are income earning opportunities, the absence of poverty, educational quality, public safety, involvement in local civic and interest groups, and various aspects of a clean and enjoyable environment. The relative importance of such characteristics varies among individuals and communities but they all attract considerable attention.



Arroyo Grande High School, San Luis Obispo County.

In this section, FRAP uses the concept of well being to capture the themes that are consistently raised in venues ranging from local coffee shops, real estate offices, and assessments of communities, to governmental initiatives to deliver services. Some of the

Historical background

A range of approaches has been developed to capture a more robust picture of the social and economic character of communities and regions. Some applications are based on concepts like community stability, well being, social capital, community capacity, and quality of life for people and communities in forest and rangeland areas. Since the 1920s, public policy attention has focused on the strength of the major commodity based industries in these areas as the key determinant for community stability. Since the 1970s, state and federal planning efforts involve the use of considerably more data on a wide range of social and economic variables. These variables are used in a wide variety of analytical methods.

In California, the U.S. Forest Service planning efforts for some of the national forests presented many different data sets specifically related to potential changes in public sector forest management. Non-profit organizations such as the Sierra Business Council (1996, 1999) and the Great Valley Center (1999)

have also produced assessments that analyzed a range of well being factors for some of the counties with significant forest and rangeland areas. These efforts typically use individual counties as the unit for reporting. Detailed community level assessments in California were done as part of the Sierra Nevada Ecosystem Project (Kusel, 1996; Stewart, 1996) and, more recently, as a follow-up project to the Northwest Forest Plan (Doak and Kusel, 2001). Community level analyses capture the character of an area better than regional or county based analyses but are dependent on the use of the detailed U.S. Census Bureau information that is available only once a decade, or from expensive local surveys.

For this analysis, FRAP used county level data due to the large number of counties and the lack of available community level data from the data summaries released from the 2000 Census before mid-2002.

Measuring socio-economic conditions in rural California

The underlying logic of this assessment is that higher well being scores correspond with higher levels of personal income, stronger community networks, and the fortune of having good initial conditions. A statewide understanding of the absolute and relative status of each county is valuable for guiding local, state, and federal policies for these areas. For this assessment, FRAP uses data sets covering 25 indicators from all of California's 58 counties (Table 1). Information on all 25 indicators is linked for each county and by county-based bioregion (see [Introduction](#)). However, indicator information is displayed throughout this section only for selected county-based bioregions that best represent the rural forest and rangeland areas in the State.

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The data sets were chosen to provide a broad portrait of different components related to the overall concept of well being. Since the data is aggregated at the county level, it hides higher and lower values at both the individual and community scale. However, the countywide averages provide relevant comparisons among all counties and between the forest and rangeland counties, agricultural counties, and metropolitan counties.

The indicators discussed here are quite varied; as are what would be considered the determinants of a sense of well being. In many respects, the indicators match up closely to the attributes of a community that a real estate agent would use to describe an area to a potential client. Factors covering the economic status of the residents and the cost of a major expense, such as housing, will be some of the most significant factors. The quality of local health and safety services, quality and funding of the school system, levels of civic participation, and natural amenities will all play significant roles in defining the overall quality.

All of these attributes may show an increased capacity to work on common civic activities. This is closely tied to the concept of social capital as developed by Robert Putnam in *Bowling Alone* and other books and applied to forest and rangeland areas in California (Sabatier et al, 1999; Doak and Kusel, 1996). With a community, greater well being brings more capability to function cohesively in addressing local problems and in responding to outside issues. Community residents also have the freedom and willingness to be involved. The best collaboration occurs when people have a common geography,

common interests, a pressing problem, and other traits that encourage the creation of trust and communication.

Methodology for comparison of county socio-economic conditions: income vs. well being index

For this assessment, FRAP worked with a subset of available data (indicators) that captures major themes common to socio-economic conditions. While there is little agreement on the short list of critical components to measure and analyze socio-economic conditions, FRAP used a subset of 12 indicators (of the 25 total indicators) organized into four themes to create a well being index. This index is compared to a fifth theme—income, measured by one indicator per capita income. The themes capture many of the major concerns within rural California and allow for an objective comparison to the more metropolitan and agriculturally oriented counties in the State.

The five themes—income, equity, investment in education, safe and involved communities, and quality of life—are described below.

- **Income:** Income is the most commonly used socio-economic measure. Per capita income was chosen as the best estimate of income levels as it captures the potential for individuals to purchase desired goods and services and support local government budgets. All things being equal, a region with high per capita incomes would be expected to also have invested in improving desired components of well being at the household unit or through governmental programs. The use of any average income statistic to capture the full range of well being has many drawbacks. By definition, average values provide no insight into how many people have very low or very high incomes and how income relates to the cost of basic goods and services.
- **Equity:** FRAP added a number of measurements to capture what fraction of the population is at the lower end of the economic spectrum as measured by their classification under federal poverty measurements and home ownership. Higher levels of equity are correlated with measures such as lower rates of poverty and greater levels of home ownership. State and local public policies have only limited impact on income but can have significant impact on many other components that influence well being.
- **Investment in education:** Education is an important issue for families, communities, and the State. While California has a relatively low ratio of expenditure per pupil as compared to other states, many counties invest to increase local funding. This is especially true for investments in computers and Internet access for students.
- **Safe and involved communities:** This theme captures the commonly expressed desires of many Americans such as low rates of crime, available health care, high rates of voting, and the presence of active local organizations such as watershed councils and Fire Safe Councils.
- **Quality of life:** These factors are used to capture aspects such as the availability of open space, good air quality, pleasant weather, and short commutes. The variables chosen for this final category will often not represent the most visible topic in any one county at a specific time but do capture some commonly agreed upon factors.

Table 1 summarizes all 25 indicators and the broader themes to which they are related. The indicators used to create the “composite well being index” were computed based on the value of 12

indicators relative to the State average. These indicators were chosen based on high data quality and commonly understood topics to give similar weighting to each of the themes.

Table 1. Socio-economic themes and indicators used to create the composite well being index

Five themes	Indicators in the FRAP composite well being index	Other indicators not in the FRAP composite well being index
Theme 1: Income	Per capita income	
Theme 2: Equity	Low poverty rate Low food stamp need Home ownership rate	Low poverty rate (0–17 age only) Number of bankruptcies Number of new single family homes Number of new multi-family units
Theme 3: Investment in education	Per pupil spending Classroom computers per 100 students Percentage of students with SAT score over 1000	Classrooms with Internet access CD ROMs per 100 students Classrooms with wide area networks
Theme 4: Safe and involved communities	Physicians per 1000 population Voter participation Low burglary rate	Low violent crime rate Number of active watershed groups Number of active Fire Safe Councils
Theme 5: Quality of life	Short commute (less than 30 minutes)* Natural amenity index Absence of high particulate days	Low unincorporated population density Air pollution – ozone

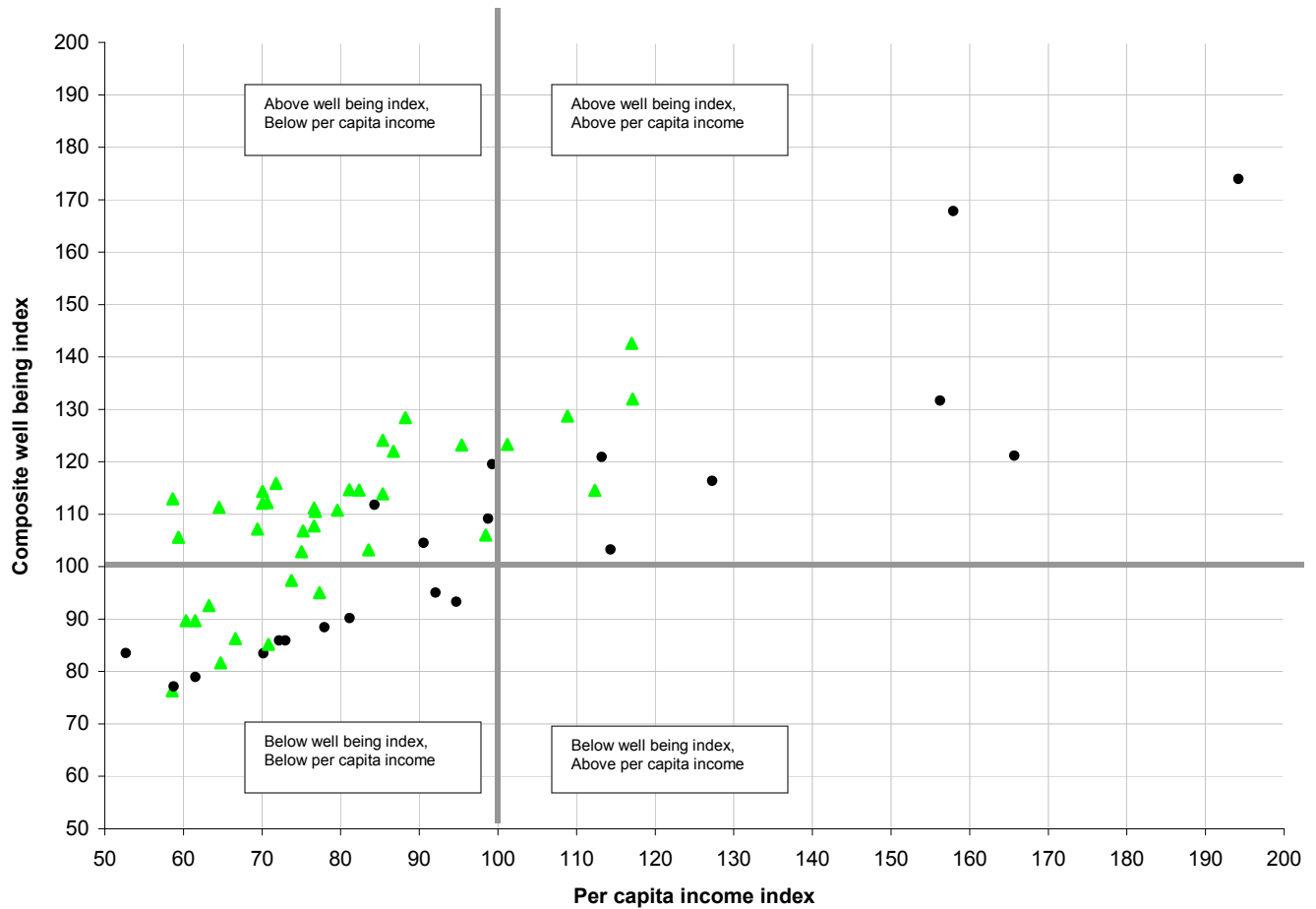
*Commute data used in index represents 1990 data

Findings on comparisons of county socio-economic conditions

Figure 2 compares the composite well being index to the per capita income of each county. It illustrates the relationship between per capita income and the composite index for all 58 California counties. For example, Marin County is in the upper right-hand quadrant. It scores above the statewide average for both per capita income and well being. Nevada County is in the upper left-hand quadrant—scoring above the statewide average for well being, but below for per capita income. Yuba County, on the bottom left, scores below the statewide average for well being and per capita income. This portrayal is based on the hypothesis that the fiscal reality of wealthier counties allows them to invest more to improve many of the components of well being of its residents at the household and local government level. It is not surprising that every county with per capita incomes above the State average also has a composite well being index above the State average. See [County Themes and Scores](#).

It is not surprising that every county with per capita incomes above the State average also have a composite well being index above the State average.

Figure 2. Per capita income and well being indices as a percentage of statewide average* in forest and rangeland counties



(▲) indicates forest and rangeland county

*100 percent equals statewide average

Source: Compiled by FRAP from U.S. Bureau of Economic Analysis, 2001; RAND, 2001; U.S. Census Bureau, 2001; U.S. Census Bureau 2002a; McGranahan, 1999; California Air Resources Board, 1999; California Secretary of the State, 2000

Table 2 shows all of California's 58 counties with their corresponding scores on the composite well being index and per capita income.

Table 2. Per capita income and well being indices as a percentage of statewide average* by county

County	Per capita income	Composite well being index*	Well being index			
			Equity	Education	Communities	Quality of life
Alameda	114%	103%	111%	106%	95%	97%
Alpine	85%	114%	90%	199%	58%	113%
Amador	70%	112%	160%	70%	88%	119%
Butte	74%	97%	78%	111%	88%	107%
Calaveras	69%	107%	122%	117%	72%	119%
Colusa	77%	95%	97%	95%	86%	104%
Contra Costa	127%	116%	151%	104%	104%	105%
Del Norte	59%	106%	86%	123%	72%	146%
El Dorado	95%	123%	164%	115%	98%	110%
Fresno	71%	85%	71%	99%	82%	93%
Glenn	60%	90%	85%	105%	67%	106%
Humboldt	77%	111%	82%	129%	86%	146%
Imperial	59%	77%	72%	100%	53%	87%
Inyo	81%	115%	100%	139%	108%	108%
Kern	67%	86%	84%	105%	74%	87%
Kings	53%	84%	82%	102%	78%	79%
Lake	77%	111%	86%	103%	68%	184%
Lassen	59%	113%	111%	115%	117%	109%
Los Angeles	95%	93%	83%	84%	103%	103%
Madera	61%	90%	85%	114%	71%	92%
Marin	194%	174%	248%	132%	157%	112%
Mariposa	75%	107%	102%	109%	78%	121%
Mendocino	80%	111%	89%	126%	91%	138%
Merced	62%	79%	70%	91%	62%	98%
Modoc	72%	116%	86%	149%	112%	117%
Mono	85%	124%	148%	122%	92%	118%
Monterey	98%	106%	111%	95%	102%	118%
Napa	117%	143%	188%	116%	131%	128%
Nevada	88%	128%	168%	114%	118%	103%
Orange	113%	121%	156%	100%	118%	101%
Placer	117%	132%	189%	115%	106%	108%
Plumas	84%	103%	114%	108%	80%	114%
Riverside	78%	88%	118%	84%	73%	80%
Sacramento	92%	95%	87%	105%	93%	99%
San Bernardino	70%	83%	95%	94%	81%	69%
San Benito	75%	103%	134%	100%	66%	117%
San Diego	99%	109%	117%	101%	110%	105%
San Francisco	166%	121%	101%	102%	141%	121%
San Joaquin	72%	86%	84%	90%	78%	96%
San Luis	87%	122%	131%	120%	113%	105%
San Mateo	158%	168%	277%	112%	143%	116%
Santa Barbara	101%	123%	116%	115%	121%	130%
Santa Clara	156%	132%	160%	117%	139%	103%
Santa Cruz	112%	115%	133%	105%	101%	103%
Shasta	77%	108%	88%	130%	98%	117%
Sierra	82%	115%	128%	132%	76%	93%
Siskiyou	71%	112%	89%	145%	97%	120%
Solano	84%	112%	164%	89%	84%	115%
Sonoma	109%	129%	150%	111%	114%	128%
Stanislaus	73%	86%	90%	84%	73%	102%
Sutter	81%	90%	94%	100%	87%	83%
Tehama	63%	93%	87%	110%	77%	99%
Trinity	65%	111%	87%	163%	81%	115%
Tulare	65%	82%	71%	96%	71%	93%
Tuolumne	70%	114%	121%	120%	89%	125%
Ventura	99%	120%	153%	103%	106%	117%
Yolo	91%	105%	87%	102%	113%	103%
Yuba	59%	76%	65%	88%	60%	97%

*The composite index is an average of the 12 components of well being within the equity, education, communities, and quality of life groups.

Source: Compiled by FRAP from U.S. Bureau of Economic Analysis, 2001; RAND, 2001; U.S. Census Bureau, 2001; U.S. Census Bureau 2002a; McGranahan, 1999; California Air Resources Board, 1999; California Secretary of the State, 2000

Findings on income indicators

Per capita income

Per capita personal income is calculated as the personal income of the residents of an area divided by the population of that area. Personal income is calculated as the sum of wage and salary disbursements, other labor income, proprietors' income, rental income, personal dividend and interest income, and transfer payments.

California's real per capita income increased almost ten percent from 1990 to 1999. In terms of per capita income growth from 1990-1999, several of the major forest and rangeland bioregions exceeded the State average. The Sierra far exceeded the State average with a 16 percent increase in per capita income. The Klamath/North Coast, Sacramento Valley, and Central Coast bioregions had similar growth rates compared with the rest of the State, while the Modoc bioregion experienced lower per capita income growth (Table 3).

Only 12 counties within California ranked higher than the State average for per capita income. Three—Placer, Santa Cruz, and Santa Barbara—are classified as forest and rangeland counties.

National figures show California's per capita income ranks higher than the U.S. average by nearly 5 percent. However, California's strong per capita income is not reflected within forest and rangeland bioregions. All forest and rangeland bioregions had per capita income levels below the State average (Table 4). These data sets suggest that forest and rangeland counties do not have stagnating economies but they are not catching up with metropolitan income levels.

In 1999, only 12 counties within California ranked higher than the State average for per capita income. Nine of these counties were located in counties classified for this assessment as Urban (see [Introduction](#)). The remaining three—Placer, Santa Cruz, and Santa Barbara—were the only counties classified as forest and rangeland counties that maintain a higher per capita income than the State average. See [All Bioregion and County per Capita Income](#).

Table 3. Per capita personal income by forest and rangeland bioregion, 1990-1999 (1999 constant dollars)

Bioregion	1990	1999	Percentage change (1990-1999)
United States	24,959	28,546	14
State of California	27,321	29,856	9
Modoc	17,294	18,361	6
Klamath/North Coast	20,286	22,339	10
Sierra	24,707	28,614	16
Central Coast	26,960	29,557	10
Sacramento Valley	23,368	25,655	10

Source: U.S. Bureau of Economic Analysis, 2001

Table 4. Per capita personal income for the U.S., California and California's forest and rangeland bioregions (1999 constant dollars)

Bioregion	1990	Percentage of State average (1990)	Percentage of U.S. average (1990)	1999	Percentage of State average (1999)	Percentage of U.S. average (1999)
United States	24,959			28,546		
State of California	27,321		109	29,856		105
Modoc	17,294	63	69	18,361	61	64
Klamath/North Coast	20,286	74	81	22,339	75	78
Sierra	24,707	90	99	28,614	96	100
Central Coast	26,960	99	108	29,557	99	104
Sacramento Valley	23,368	86	94	25,655	86	90

Source: U.S. Bureau of Economic Analysis, 2001

Findings on equity indicators

Poverty and persons aged 0-17 living in poverty

To determine the poverty level, the U.S. Census Bureau uses a set of income thresholds that vary by family size and composition. If the total family income is less than that family's threshold, then all members of that family are considered poor. Poverty thresholds do not vary geographically, but they are updated annually for inflation using the Consumer Price Index . The official definition of poverty is based on income before taxes and does not include capital gains and non-cash benefits (such as public housing, Medicaid, and food stamps). Because lower income may provide fewer lifestyle options, it becomes important to review poverty levels as a measure of quality of life.

The percentage of people in poverty in California fell 6 percent between 1990 and 1997. Additionally, persons aged 0-17 classified as living in poverty in California decreased by 3 percent. The five forest and rangeland bioregions all experienced drops in their poverty levels. The Modoc and Sacramento Valley bioregions led the five bioregions with an overall 7 to 8 percent decrease. Poverty levels within the Klamath/North Coast, Sierra, and Central Coast bioregions generally decreased by 5 percent, which is slightly less than the State average (Table 5).

The only forest and rangeland bioregions with poverty rates higher than the statewide average were the Klamath/North Coast (14 percent) and the Sacramento Valley (13 percent). The Sierra bioregion has the lowest poverty level (7 percent) of the forest and rangeland bioregions displayed in Table 5.

The Sierra bioregion has the lowest poverty level (7 percent) of California's bioregions.

Similarly, all counties within California experienced poverty level drops between 1990 and 1997, including some counties within the Klamath/North Coast bioregion. See [Bioregion and County Poverty Rates](#).

Table 5. Percentage of population in poverty by forest and rangeland bioregion, 1990 and 1997

Bioregion	1990			1997			Percentage change in poverty rates (1990-1997) all ages	Percentage change in poverty rates (1990-1997) 0-17 years old
	Total population	Percentage of population in poverty		Total population	Percentage of population in poverty			
		All ages	0-17 years old		All ages	0-17 years old		
State of California	29,758,213	17	7	32,206,855	11	4	-6	-3
Modoc	37,276	18	7	43,125	10	4	-8	-3
Klamath/North Coast	330,148	20	8	353,700	14	5	-5	-3
Sierra	554,503	12	5	658,280	7	2	-5	-2
Central Coast	1,877,877	13	6	2,001,950	9	3	-4	-3
Sacramento Valley	1,724,926	20	9	1,896,600	13	5	-7	-4

Poverty source: U.S. Census, 2001
Population source: California Department of Finance, 2001

Food stamp distribution per 100,000 residents

Food stamps are a social service provided to those who have incomes below the poverty level. Recognizing areas where food stamp issuance is widespread helps to identify pockets of poverty. Overall, the number of persons per 100,000 receiving food stamps in California rose 14 percent between 1990 and 1998.

Much of this increase is related to food stamp increases within the southern part of the State. The Modoc, Klamath/North Coast, and Sierra bioregions were three of four bioregions in the State reporting decreases in food stamps issued between 1990 and 1998 (Table 6). Regional distribution trends of food stamps followed the early recession period and declined as the economy recovered by 1998. Additionally, the northern forest and rangeland bioregions exceeded the State average for distribution of food stamps. The more affluent Central Coast and Sierra bioregions were below the State average.

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Table 6. Number of food stamp recipients per 100,000 persons by forest and rangeland bioregions, 1990, 1994 and 1998

Bioregion	1990	1994	1998	Percentage change (1990-1998)	Percentage of statewide average (1998)
State of California	6,341	9,809	7,219	14	
Modoc	9,415	11,329	9,373	0	130
Klamath/North Coast	10,874	13,019	10,715	-2	148
Sierra	4,429	5,980	4,327	-2	60
Central Coast	4,156	6,379	4,524	9	63
Sacramento Valley	10,415	13,724	11,741	13	163

Source: RAND, 2001

In 1998, Amador County led all counties with a 41 percent increase from 1990 in residents receiving food stamps. Also in that year, Placer County had the lowest rate of food stamps per 100,000 among forest and rangeland counties at 41 percent of the state average. With a 62 percent drop between 1990 and 1998, San Benito County showed the largest decrease. See [Bioregion and County Food Stamps](#).

Bankruptcies

California bankruptcy statistics reports by RAND show the number of bankruptcies by type (i.e., chapter of the bankruptcy code) and the rate per 1,000 residents. Totals reflect filings for all chapters for 12-month periods. Bankruptcies indicate changing economic conditions. Furthermore, increasing bankruptcies can lead to decreasing prosperity and pressure on social systems.

Total filings of bankruptcies in California dropped by nearly 16 percent between 1996 and 2001. Within the State's forest and rangeland bioregions, the Central Coast bioregion had the second largest drop in filings in the state with a 24 percent decrease. While the overall bankruptcy rate for the State dropped, two of the forest and rangeland bioregions had increased rates. The Klamath/North Coast bioregion had a minimal increase in bankruptcy filings and the Modoc bioregion rose four percent (Table 7).

Table 7. Number of bankruptcy filings by forest and rangeland bioregion, 1996 and 2001

Bioregion	1996	2001	Percentage change (1996-2001)
State of California	169,273	142,655	-16
Modoc	113	117	4
Klamath/North Coast	1,269	1,274	0
Sierra	3,059	2,734	-11
Central Coast	9,522	7,272	-24
Sacramento Valley	9,970	9,896	-1

Source: RAND, 2001

All counties within the Central Coast bioregion showed decreases of ten percent or more except San Benito County. Bankruptcies rose in San Benito County by 8 percent. Conversely, Santa Cruz County experienced the largest decrease (35 percent) in bankruptcies. See [Bioregion and County Bankruptcies](#).

Single-family home construction

Single-family housing includes detached, semi-detached, row house, and townhouse units. Single-family ownership is an indicator of economic prosperity and a measure of overall affordability of living. Low levels of home ownership imply weaker economic conditions or discrepancies in incomes where only the wealthy are able to afford homes.



Aerial of Paso Robles, San Luis Obispo County. Photograph by Roland and Karen Muschenetz.

In California, the number of new housing units rose two percent between 1990 and 2000. Over this period, the Sierra and Central Coast are the only forest and rangeland bioregions to experience increases in single-family homes built. The Central Coast led all bioregions with a 49 percent increase in new single-family homes in 2000. On the other hand, the Klamath/North Coast bioregion saw the largest decline of new units between 1990 and 2000, falling 56 percent (Table 8).

Table 8. Number of new single-family housing units by forest and rangeland bioregion, 1990, 1995, and 2000

Bioregion	1990	1995	2000	Percentage change (1990-2000)	Percentage of statewide average (2000)
State of California	103,819	68,689	105,595	2	
Modoc	150	101	123	-18	<1
Klamath/North Coast	2,014	1,017	897	-56	1
Sierra	7,885	4,835	8,383	6	8
Central Coast	5,193	5,371	7,728	49	7
Sacramento Valley	13,735	6,145	9,718	-29	9

Source: RAND, 2001

Between 1990 and 2000, several counties within forest and rangeland bioregions exhibited unique patterns. Ventura (120 percent) and San Benito (114 percent) counties were second and third among counties in the State with increases in new single-family home construction. Reflecting some of the Klamath/North Coast's bioregional decline, Lake County had the second largest decrease among counties at -74 percent. See [Bioregion and County New Single Family Home](#).

Multi-family housing

Multi-family housing includes duplexes, three to four-unit structures, and apartment type structures with five units or more. The presence of multi-unit housing indicates an equitable housing setting with available living conditions for a range of incomes. California's number of new multi-family housing units fell 29 percent from 60,494 units in 1990 to 42,945 units in 2000 (Table 9). California has not rebounded to 1990 numbers. However, since 1995, California's new multi-family homes have increased 159 percent showing robust recovery from the early 1990's recession.

Forest and rangeland bioregions show a similar pattern to the statewide trend in new multi-family housing construction. Only two forest and rangeland bioregions had increases of new multi-family units between 1990 and 2000; six bioregions have had increases since 1995. The Sierra bioregion is one of only two within California to have an increase in multi-family homes between 1990 and 2000. Rising from 722 units in 1990 to 1,967 units in 2000, the Sierra bioregion had a 172 percent increase in new multi-family homes (Table 9). Since 1995, the Sierra bioregion's new multi-family homes have ballooned 459 percent.

From a county perspective, Tehama County led all counties with a 925 percent increase rising from two new multi-family homes in 1990 to 82 in 2000. Other counties with large increases included Placer at 536 percent and Lake County at 550 percent. In 2000, Placer led all forest and rangeland counties with 1,634 new units and is ranked seventh in California. This increase in homes built has accounted for a good portion of the Sierra bioregion's recent growth. Calaveras, Inyo, Mariposa, Plumas, Sierra, Trinity,

Del Norte, and Modoc counties had no new units in 2000. See [Bioregion and County New Multi-Family Homes](#).

Table 9. Number of new multi-family housing units by forest and rangeland bioregion, 1990, 1995, and 2000

Bioregion	1990	1995	2000	Percentage change (1990-2000)	Percentage of statewide average (2000)
State of California	60,494	16,604	42,945	-29	
Modoc	34	68	4	-88	0
Klamath/North Coast	401	247	162	-60	0
Sierra	722	352	1,967	172	5
Central Coast	2,376	820	1,647	-31	4
Sacramento Valley	4,204	786	1,940	-54	5

Source: RAND, 2001

Home ownership

Home ownership is a measure of the ability of people to secure income commensurate with the cost of living. Home ownership increased slightly in California by 1.3 percent between 1990 and 2000. The Klamath/North Coast and Modoc bioregions had a slight decrease in home ownership (Table 10).

Table 10. Number of housing units and percentage of homeowners and renters by forest and rangeland bioregion, 1990 and 2000

Bioregion	1990			2000		
	Number of housing units	Percentage owners	Percentage renters	Number of housing units	Percentage owners	Percentage renters
State of California	10,381,206	56	44	11,502,870	57	43
Modoc	12,254	69	31	13,409	69	31
Klamath/North Coast	128,093	64	36	141,791	63	37
Sierra	209,871	71	29	269,903	74	27
Central Coast	635,334	59	41	700,855	61	39
Sacramento Valley	649,157	58	42	739,819	59	41

Source: U.S. Census, 2002a

All forest and rangeland bioregions have greater home ownership rates than the State average. The Sierra bioregion leads all others with a 74 percent home ownership rate. Not surprisingly, the counties of the Sierra bioregion led the State in home ownership on a countywide level. At 79 percent, Calaveras County leads the State in home ownership. Calaveras is followed closely by Nevada County (76 percent) and Amador County (76 percent) in home ownership rates. Reflecting the ownership losses in the Klamath/North Coast bioregion, the biggest countywide drop in home ownership rates occurred in Del Norte County (two percent). See [Bioregion and County Percentage of Home Owners and Renters](#).

Findings on investment in education indicators

Investments in education are summarized by measuring expenditures per pupil, resultant testing success from standardized SAT scores, and the level of information technology in schools. These indicators span a wide variety of educational influences and reveal relative strengths in support of education.

Annual pupil spending

Spending on education is a measure of a quality education program. Per pupil spending statistics reflect the current expense of education and average daily attendance in California school districts as defined by the California Department of Education.

Between 1996 and 2000 California's annual per pupil spending increased 26 percent. Sierra County was the only forest and rangeland county to have a per pupil spending decrease in those years. Lassen County led all counties with a 62 percent increase in per pupil spending (Table 11).

Table 11 shows that 2000 annual per pupil spending in nearly all forest and rangeland counties was similar to the State average. Alpine led all counties with \$15,637 per pupil in 2000. While an increase in education spending is expected with growth, many forest and rangeland counties with lower growth and lesser economies of scale, such as Alpine, showed gains (Table 11). See [County Per Pupil Spending](#).

Table 11. Amount of annual per pupil spending (county district average) by forest and rangeland county, 1996-2000 (2000 constant dollars)

County	1996	1997	1998	1999	2000	Percentage change (1996-2000)	Percentage of state average (2000)
State of California	4,905	5,329	5,332	5,823	6,200	26	
Alpine	10,380	11,718	14,433	16,361	15,637	51	252
Amador	4,026	4,743	4,779	5,590	5,261	31	85
Butte	4,762	5,570	6,010	6,866	5,938	25	96
Calaveras	4,488	5,166	5,795	6,468	6,054	35	98
Colusa	5,042	5,657	5,618	6,193	5,716	13	92
Del Norte	5,250	5,615	6,164	6,416	6,035	15	97
El Dorado	4,476	5,168	5,781	6,439	5,868	31	95
Glenn	5,237	5,826	6,001	6,511	6,073	16	98
Humboldt	5,154	6,110	6,088	6,870	6,789	32	110
Inyo	7,810	9,130	8,725	9,471	9,529	22	154
Lake	4,900	5,528	5,828	6,396	6,107	25	99
Lassen	5,350	6,111	6,077	7,620	8,673	62	140
Mariposa	5,109	5,358	6,153	6,660	6,491	27	105
Mendocino	6,515	7,300	7,485	8,188	8,106	24	131
Modoc	6,164	6,615	7,069	7,835	7,361	19	119
Mono	5,747	6,789	7,214	7,503	7,490	30	121
Monterey	5,544	6,120	6,306	7,375	7,248	31	117
Nevada	4,645	5,138	5,450	6,196	5,882	29	95
Placer	4,433	5,215	5,347	5,761	5,702	29	92
Plumas	5,087	5,420	6,054	7,173	6,515	28	105
Sacramento	4,737	5,328	5,293	5,877	5,492	16	89
San Benito	5,473	5,148	6,256	7,122	6,604	21	107
San Luis Obispo	5,017	5,642	5,502	5,648	5,825	16	94
Santa Barbara	4,900	5,573	5,889	6,417	6,167	26	100
Santa Cruz	4,722	5,495	5,386	6,289	6,102	29	98
Shasta	4,832	5,611	6,116	6,947	6,573	36	106
Sierra	6,134	6,957	2,943	2,412	3,611	-41	58
Siskiyou	5,974	6,225	7,159	8,138	8,390	40	135
Sutter	4,406	5,433	5,497	6,137	5,554	26	90
Tehama	5,015	5,596	6,042	7,025	7,040	40	114
Trinity	6,779	8,714	7,720	8,395	8,563	26	138
Tuolumne	4,665	5,356	5,877	6,468	6,147	32	99
Ventura	4,526	5,085	5,191	5,746	5,400	19	87
Yolo	4,687	5,210	5,407	6,006	5,682	21	92
Yuba	4,809	5,634	6,006	5,584	5,563	16	90

Source: RAND, 2001

Students taking SAT scoring over 1,000

Scholastic Aptitude Test (SAT) scores reveal the quality of education, above and beyond per pupil expenditure. While per pupil expenditures could be expected to increase scores, it is not always the case. Successful education programs are a combination of teacher, administrative, and parent partnerships.

Between 1990 and 1999, SAT scores over 1,000 rose less than one percent in California and the total scores were in line with the national median scores (College Entrance Examination Board, 2001). See [2001 College Bound Seniors—A Profile of SAT Program Test Takers](#).

California's forest and rangeland bioregions experienced increases from one to seven percent, with the lone exception of a three percent drop in the Sacramento Valley. The Klamath/North Coast (6 percent) and Sierra (6 percent) bioregions had the greatest increase of scores over 1,000 between 1990 and 1999 (Table 12).

The Klamath/North Coast (6 percent) and Sierra (6 percent) bioregions had the greatest increase of SAT scores over 1,000 between 1990 and 1999.

Not only did the forest and rangeland bioregions show improvement in scores, they also ranked highly in percentage scoring over 1000. In 1999, two forest and rangeland bioregions ranked first and second in the State for test scores greater than 1,000. The Klamath/North Coast bioregion had the highest percentage of scores over 1,000 with 65 percent. The Sierra bioregion ranked second in the State with 62 percent. Of the forest and rangeland bioregions, only Modoc ranked below the State average of test scores over 1,000 with 51 percent (Table 12).

Reflecting the strength of forest and rangeland bioregion's, Mariposa and Humboldt counties had 70 percent of SAT test takers scoring over 1,000 in California's 58 counties. See [Bioregion and County Percentage Scoring Over 1,000 on SAT](#).

Table 12. Percentage of students scoring over 1,000 on SAT by forest and rangeland bioregion, 1990, 1995, and 1999

Bioregion	1990	1995	1999
State of California	51	50	52
Modoc	50	33	51
Klamath/North Coast	59	62	65
Sierra	56	60	62
Central Coast	56	57	60
Sacramento Valley	56	54	53

Source: RAND, 2001

Student computer availability

The extent to which the kindergarten through grade 12 student population has access to the Internet and related technology indicates both the willingness of Californians to invest in the technology and the availability of the infrastructure to support this kind of information system in the schools. Computer availability for these students can also measure the increasing ability to cope with information.

Between 1996 and 1999, the number of computers per 100 students increased 49 percent in California. All ten bioregions exhibited similar increases of 39 to 67 percent. Leading the State in 1999, the Sierra bioregion saw a 68 percent increase of computers per 100 students from 1996 (Table 13).

While the forest and rangeland bioregions had similar or higher increases in computer availability than the State, the number of computers per 100 students exceeded the State average in all forest and rangeland bioregions in 1999. At 19 computers per 100 students in 1999, the Modoc bioregion ranked second (Table 13).

Alpine County led all counties with 46 computers per 100 students. Alpine County also had the biggest increase of computers per 100 students from 1996-1999 at 126 percent. Other counties of note

include Modoc with 32 computers per 100 students and Trinity with 31 computers per 100 students, second and third in the State in 1999. See [Bioregion and County Computer Availability](#).

Table 13. Number of computers per 100 students by forest and rangeland bioregion, 1996-1999

Bioregion	1996	1997	1998	1999	Percentage change (1996-1999)
State of California	9	10	12	13	49
Modoc	13	16	14	19	39
Klamath/North Coast	12	14	15	18	55
Sierra	10	13	15	17	68
Central Coast	9	10	11	14	56
Sacramento Valley	10	11	13	17	66

Source: RAND, 2001

Student Internet access availability in classrooms

Another measure of education quality is the ability of students to use information technology. With Internet access representing a source of vast media content often usable for education purposes; classrooms with Internet access represents improved educational settings.

As the Internet became more prevalent in the 1990s, classroom access began to rise. In 1999, California had an average of 2.5 classrooms with Internet access for every 100 students enrolled in K-12 schools. All forest and rangeland bioregions saw increases of 100 percent or more (Table 14).

The Sierra and Klamath/North Coast bioregions ranked first and second in the State with 4.8 and 4.4 classrooms with Internet access for every 100 students enrolled, respectively. The Modoc bioregion (2.4) was the only forest and rangeland bioregion that came in below the State average of 2.6 classrooms with Internet access for every 100 students enrolled in 1999 (Table 14).

Alpine County led all counties with 13 classrooms with Internet access for every 100 students enrolled in 1999. Calaveras County experienced a 2720 percent increase of classrooms with Internet access per 100 students rising from 0.2 in 1996 to 5.6 in 1999. Mono County was second in the State in 1999 with 8.6 classrooms with Internet access per 100 students. See [Bioregion and County Classroom Internet Access](#).

Table 14. Number of classrooms with Internet access per 100 students by forest and rangeland bioregion, 1996-1999

Bioregion	1996	1997	1998	1999	Percentage change (1996-1999)
State of California	0.6	1.1	1.7	2.6	323
Modoc	1.2	1.0	2.0	2.4	100
Klamath/North Coast	1.1	2.1	3.2	4.4	302
Sierra	0.5	2.0	2.9	4.8	828
Central Coast	0.6	1.3	1.7	2.7	360
Sacramento Valley	0.7	1.3	1.9	2.8	282

Source: RAND, 2001

Availability of computers with CD ROMs

Similar to the potential educational benefits to the classroom from Internet and computer access, a CD-ROM indicates more recent computers and better software capacity. In 1999, California had a state average of eight computers with CD ROMs per 100 students. All forest and rangeland bioregions exceeded the State average of eight computers per 100 students in 1999. The Modoc bioregion led the State with a 13.4 average in 1999 (Table 15).

Table 15. Number of computers with CD ROMs per 100 students by forest and rangeland bioregion, 1999

Bioregion	1999
State of California	8
Modoc	13
Klamath/North Coast	12
Sierra	12
Central Coast	9
Sacramento Valley	10

Source: RAND, 2001

Alpine County led California counties with 46 computers with CD ROMs per 100 students. Other notable counties included Sierra with a 32.3 average and Modoc with a 26.1 average. See [Bioregion and County Computers with CD ROMs](#).

Available computers with Internet access connected to wide area networks (WAN) per 100 students

Another aspect of educational and technological quality is measured by the number of computers with Internet access within a wide area network. A wide area network that connects schools throughout the State indicates a higher level of sophistication and investment in information technology in the schools.

Table 16. Number of computers with Internet access connected to wide area network per 100 students by forest and rangeland bioregion, 1999

Bioregion	1999
State of California	2.0
Modoc	1.5
Klamath/North Coast	2.7
Sierra	3.8
Central Coast	2.1
Sacramento Valley	2.3

Source: RAND, 2001

In 1999, California had an average of two computers with Internet access connected to a wide area network per 100 students. The Sierra bioregion led the State with a 3.8 computers with Internet access connected to a wide area network per 100 students average in 1999 (Table 16). Several forest and rangeland counties such as Placer (6.6), Mono (4.1), Trinity (4.6), and Modoc (4.1) were well above the State average. See [Bioregion and County Classroom WAN Access](#).

Findings on safe and involved communities indicators

In order to determine the desirability of an area for residents and overall social capital within communities, a number of life style attributes can be considered. These include the availability of quality healthcare, low crime rates and community involvement.

While quality health care and low crime rates may be obvious measures of social capital, community involvement can also indicate levels of social capital. The relationships between people that develop from active participation in elections and community partnerships demonstrate a dynamic of social networking important to a functioning community. The level of involved communities evaluates this dynamic by reviewing voter participation as a percentage of registered voters, as well as counting the numbers of watershed groups, Fire Safe Councils, and funded fuel reduction projects.



Voting in the 2000 primary election

Physicians per 1,000 residents

An area's desirability can be impacted significantly by the availability of good quality healthcare. The number of doctors available in a given area can make a tremendous difference in healthcare. A long drive to a doctor's office or hospital may mean the difference between life and death. Thus, people view having enough doctors as a significant life style attribute. Between 1990 and 1999, the number of physicians per 1,000 people rose by 3 percent in California. Most forest and rangeland bioregions had substantial increases exceeding the State average. The Klamath/North Coast bioregion led with a 16 percent increase in physicians per 1,000 people (Table 17).

Most forest and rangeland bioregions had substantial increases in physicians per 1,000 residents, exceeding the State average.

Even with these increases the forest and rangeland bioregions all rank below the State average of 2.5 physicians per 1,000 persons. For example, with 1.2 physicians per 1,000 people, the Modoc bioregion has the second lowest rating within the State (Table 17).

Table 17. Number of physicians per 1,000 persons by forest and rangeland bioregion, 1990 and 1999

Bioregion	1990	1999	Percentage change (1990-1999)
State of California	2.4	2.5	3
Modoc	1.2	1.2	0
Klamath/North Coast	1.7	2.0	16
Sierra	1.8	2.0	12
Central Coast	2.0	2.2	12
Sacramento Valley	2.2	2.4	11

Source: RAND, 2001

In particular, the Sierra bioregion experienced wide variations within its counties. With an increase of 1.7 to 2.5 physicians per 1,000 people, Mono County led the State with a 47 percent increase. In contrast, Alpine County suffered the greatest loss, falling 56 percent from 1.8 to 0.8 physicians per 1,000 persons. A part of the Modoc bioregion, Modoc County has the lowest number of physicians per 1000 persons in the State with only 0.4. See [Bioregion and County Physicians](#).

Burglaries per 100,000 residents

The amount of crime in an area can serve as a deterrent to people considering moving to a region and imply other underlying social problems. A high crime rate tends to prevent people from choosing to live in a region, while a low crime rate is an incentive to move into an area.

Overall, California experienced a 51 percent drop in burglaries between 1990 and 1999. All forest and rangeland bioregions generally had lesser drops ranging from 24 to 51 percent. The Central Coast was the leading forest and rangeland bioregion with a 51 percent decrease, similar to the State average (Table 18).

The Modoc bioregion leads the State with the smallest ratio of burglaries per 100,000 residents at 355. The Central Coast followed with 520. In terms of total burglaries, most forest and rangeland bioregions had lesser rates than the State average (Table 18).

Table 18. Number of burglaries per 100,000 residents by forest and rangeland bioregion, 1990, 1995, and 1999

Bioregion	1990	1995	1999	Percentage change (1990-1999)	Percentage of statewide average (1999)
State of California	1,362	1,109	663	-51	
Modoc	612	536	355	-42	54
Klamath/North Coast	1,278	1,419	969	-24	146
Sierra	1,094	1,131	677	-38	102
Central Coast	1,058	847	520	-51	78
Sacramento Valley	1,471	1,513	873	-41	132

Source: RAND, 2001

Dropping from 2,738 to 844 burglaries per 100,000, San Benito County led the State with a 69 percent drop between 1990 and 1999. Within other forest and rangeland counties, Modoc (312), Lassen (358), Nevada (471), Santa Barbara (429), and Ventura (492) had the lowest burglaries per 100,000. See [Bioregion and County Burglaries](#).

Violent crimes per 100,000 residents

Violent crimes include crimes against people, such as homicide, forcible rape, robbery, and aggravated assault. California's violent crimes dropped more than 40 percent from 1990-1999. All forest and rangeland bioregions had a similar or lesser violent crime rate drop compared to the State average. The Modoc bioregion was the leading forest and rangeland bioregion in having a decrease in violent crimes similar to the State average in 1999. The Sierra bioregion had the smallest drop in violent crimes within the State at eight percent (Table 19).

In terms of total violent crimes per 100,000 residents all forest and rangeland bioregions have lower rates than the State average (Table 19).

Table 19. Number of violent crimes per 100,000 persons by forest and rangeland bioregion, 1990, 1995 and 1999

Bioregion	1990	1995	1999	Percentage change (1990-1999)
State of California	1,048	951	627	-40
Modoc	429	504	256	-40
Klamath/North Coast	485	541	406	-16
Sierra	368	460	337	-8
Central Coast	468	575	381	-22
Sacramento Valley	721	849	545	-24

Source: RAND, 2001

In 1999, Sierra County had the least amount of violent crimes within the State with 124 violent crimes per 100,000 residents. Within other forest and rangeland counties, Lassen, Siskyou, Trinity, Calaveras, Placer, Sierra, San Luis Obispo, and Ventura all had violent crimes at levels less than 50 percent of the State average. See [Bioregion and County Violent Crimes](#).

Voter participation as a percentage of registered voters

When comparing differing years of presidential elections, 66 percent of California's registered voters cast ballots in 1996 compared to 71 percent in 2000, marking a five percent increase. Information was not available for bioregional comparison for 1996 and 2000, however when reviewing information from 1998 to 2000, voter participation in forest and rangeland bioregions increased. While it is logical that participation would increase due to the presidential election in 2000, participation increases were greater than the State average. All forest and rangeland bioregions exceeded the State average by two to eight percent (Table 20).

In addition to increasing voter participation, the forest and rangeland bioregions led the State with high voter turnouts. In 2000, Sierra (79 percent) and Modoc (78 percent) led all bioregions with the highest turnout. Voter turnout in other forest and rangeland bioregions was also higher than the statewide average (Table 20).

In addition to increasing voter participation, the forest and rangeland bioregions led the State with high voter turnouts in 2000.

Marin County had the highest voter turnout in the State with 85 percent of registered voters casting ballots in 2000. Amador, Placer, Plumas, and Sierra counties followed with voter turnout at 81 percent or higher among registered voters. See [Bioregion and County Voter Turnout](#).

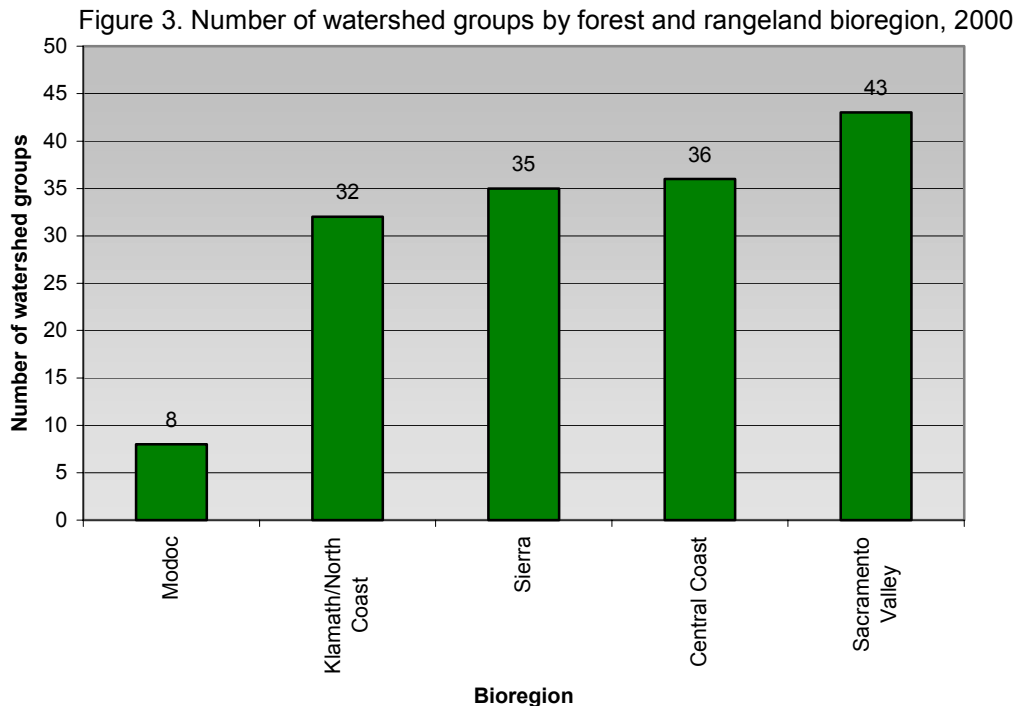
Table 20. Number of voters participating in the 1998 and 2000 elections by forest and rangeland bioregion

Bioregion	1998				2000			
	Registered to vote	Total voters	Percentage registered voters that voted	Difference from State average	Registered to vote	Total voters	Percentage registered voters that voted	Difference from State average
State of California	14,969,185	8,621,121	58		15,707,307	11,142,843	71	
Modoc	20,137	11,986	60	2	18,981	14,844	78	7
Klamath/North Coast	199,853	125,422	63	5	203,757	147,152	72	1
Sierra	394,394	266,798	68	10	417,193	331,115	79	8
Central Coast	1,060,156	616,697	58	1	1,082,072	795,879	74	3
Sacramento Valley	997,068	609,620	61	4	1,004,096	731,488	73	2

Source: California Secretary of State, 2000

Number of watershed groups by bioregion

While subjective, the number of watershed groups active in a bioregion may be indicative of the amount of common concern and focus. Compilation of this list is based on many lists of “watershed groups,” starting with the U.C. Davis Watershed Partnership Projects list, For Sake of the Salmon web site (Central Coast and South Coast), and U.C. Davis ICE database. Many watershed groups encompass several counties and bioregions; therefore some groups may be listed twice. The majority of watershed groups are found within the Klamath/North Coast, Bay/Delta, Sacramento Valley, Sierra, and Central Coast bioregions (Figure 3). See [Watershed Groups by California Bioregion](#) for complete list.



Source: compiled by FRAP from For the Sake of the Salmon, 2001; Information Center for the Environment (ICE) 2000; Watershed Partnerships Project, 2001



Existence of local Fire Safe Councils

Limited agency budgets for fire prevention and the continuing threat of wildfire led to the formation of the California Fire Safe Council (Fire Safe Council) in April 1993. With membership from the business community, governmental agencies, private citizens, and environmental groups, it is perhaps the broadest based group working toward a common goal in forest management. The Fire Safe Council work to preserve California's natural and manmade resources by mobilizing all Californians to make their homes, neighborhoods, and communities fire safe. See [Fire Safe Council](#). Since their inception, the Fire Safe Council has provided fire prevention education materials to industry leaders and their constituents, analyzed legislation pertaining to fire safety, and sought to spread local programs for fire safety and prevention.

One of the goals of the Fire Safe Council is to support and promote local Fire Safe Councils. Nearly 90 local Fire Safe Councils are established in California. The rise of the local fire safe councils is a movement distinct to the 1990s.

Existing councils are listed in Table 22. Most counties with a fuel reduction problem have a fire safe council. Some counties have more than one council based in a local community. Forest and rangeland Bioregions with regular wildfire occurrence have the most fire safe councils such as the Sierra and Sacramento Valley (Table 22).

Table 22. Number of local Fire Safe Councils by forest and rangeland county and bioregion

Bioregion and county	Groups	Bioregion and county	Groups
Statewide groups	1		
Modoc		Sierra	
Lassen	4	Alpine	0
Modoc	1	Amador-El Dorado	2
Total	5	Calaveras-Tuolumne	2
North Coast/Klamath		Inyo-Mono	6
Del Norte	1	Mariposa	3
Humboldt	3	Nevada	1
Lake	2	Placer	6
Mendocino	1	Plumas	2
Trinity	1	Total	23
Total	8	Central Coast	
Sacramento Valley		Monterey	2
Butte	5	San Benito	—
Colusa	0	San Luis Obispo	1
Glenn	0	Santa Barbara	1
Sacramento	0	Santa Cruz	1
Shasta	2	Ventura	1
Sutter	—	Total	6
Siskiyou	5		
Tehama	2		
Yolo	0		
Yuba	1		
Total	15		

Source: The Fire Safe Council, 2002

Findings on quality of life

Quality of life measures reflect what many people would desire for a place to live. Factors identified by FRAP include open space, environmental quality, and short commute time from home to work. Open space is often perceived by residents in terms of closeness of neighbors and can be reflected by population density. Environmental quality of one's community could be evaluated by any number of metrics, but for this assessment includes quality of air, climate characteristics, and presence of a variety of desirable, natural features such as water bodies. Finally, quality of life is enhanced by minimizing time commuting to work. This can produce more free time and less travel expense. Many forest and rangeland areas are typically perceived as having these types of characteristics, and the following indicators attempt to measure the status.

Population density

Population density is measured by dividing the State's population by the area in square miles for all ownerships and land cover. As shown in Table 23, the forest and rangeland bioregions have significantly lower population densities than the rest of the State. Alpine and Inyo counties are tied for the smallest population densities at two residents per square mile.

Table 23. Population density (persons per square mile) by forest and rangeland bioregion, 1970-2000

Bioregion	1970	1980	1990	2000	Percentage of statewide average (2000)
State of California	128	152	190	219	
Modoc	3	4	4	5	2
Klamath/North Coast	12	15	17	19	9
Sierra	9	14	20	26	12
Central Coast	87	113	142	163	75
Sacramento Valley	75	94	123	143	65

Source: RAND, 2001

In California, persons per square mile increased 15 percent between 1990 and 2000. California's 15 percent increase is the smallest decadal increase for the State in the past 30 years. Residents per square mile increased 19 percent between 1970 and 1980 and 25 percent between 1980 and 1990.

While forest and rangeland bioregions have remained significantly lower in density than the State average, three of the four bioregions have had larger density increases than the State average between 1970 and 2000. However, since 1970, density rates have slowed throughout all the forest and range bioregions. The Sierra bioregion has had the greatest bioregional growth between 1970 and 2000 and also has had the greatest increase since 1990 (29 percent) (Table 24). See [Bioregion and County Population Density](#).

Table 24. Population density percentage change by forest and rangeland bioregion, 1970-2000

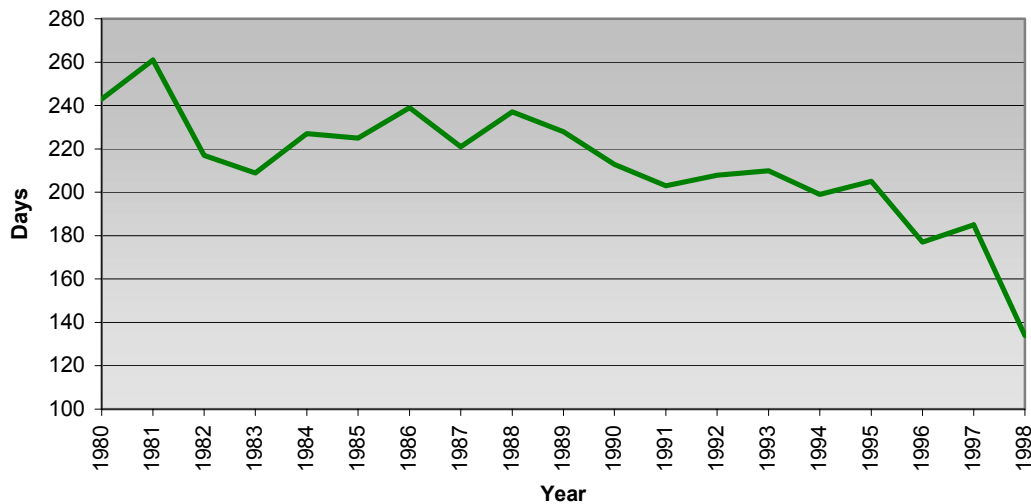
Bioregion	Percentage change (1970-1980)	Percentage change (1980-1990)	Percentage change (1990-2000)	Percentage change (1970-2000)
State of California	19	25	15	71
Modoc	24	22	21	83
Klamath/North Coast	24	17	10	59
Sierra	62	43	29	199
Central Coast	30	25	15	87
Sacramento Valley	26	30	17	91

Source: RAND, 2001

Ozone levels affecting air quality

Air quality, as reflected by ozone levels, affects quality of life by reducing aesthetics due to poorer visibility. Poor air quality can also cause health problems. In 1990, California had 213 days that exceeded State air quality standards for ozone levels (Figure 4). In 1998, ozone levels dropped bringing California down to 134 days of exceeding air quality standards and marked a 37 percent decrease from 1990 levels.

Figure 4. Number of days California exceeded State air quality standards for ozone levels, 1980-1998



Source: California Air resources Board, 1999

Within the forest and rangeland bioregions between 1990 and 1998, El Dorado County had the greatest increase of days exceeding State air quality standards for ozone levels, rising from 0 to 31 days. San Luis Obispo County had the second greatest increase between 1990 and 1998 rising from 2 to 25 days. Of the 19 forest and rangeland counties reporting, six reported a decrease in the number of days exceeding air quality standards. Ventura County had the most significant decrease, dropping from 99 in 1990 to 41 days in 1998 marking a 59 percent decrease in days exceeding air quality standards. See [County Ozone Levels](#).

Particulate matter affecting air quality

Similar to ozone, quality of life is affected by level of particulate matter as it reduces aesthetics by poorer visibility, and can cause health problems. In 1997, California had an average particulate matter level of $30 \mu\text{g}/\text{m}^3$ (weight of particles in micrograms per cubic meter of air). Most forest and rangeland bioregions had lesser levels (Table 25). The Central Coast bioregion was the only forest and rangeland bioregion to have particulate matter concentrations above the State average.

Table 25. Particulate matter concentration (highest annual arithmetic mean) by forest and rangeland bioregion, 1990, 1994 and 1997

Bioregion	$\mu\text{g} / \text{cubic meter}$			Percentage change (1990-1997)	Percentage above or below State average (1997)
	1990	1994	1997		
State of California	N/A	N/A	30	N/A	
Modoc	N/A	N/A	24	N/A	79
Klamath/North Coast	N/A	N/A	18	N/A	60
Sacramento Valley*	43	32	25	-41	84
Sierra**	N/A	N/A	25	N/A	84
Central Coast	29	26	32	9	107

*Within the Sacramento Valley Bioregion: Yuba County lacks a monitoring station; therefore the results were taken from adjacent Sutter County.

**Within the Sierra Bioregion: Alpine and Tuolumne counties lack a monitoring station, therefore the results were taken from the adjacent Mono County for Alpine and Calaveras for Tuolumne.

Source: California Air Resources Board, 2002

All counties within the Sacramento Valley, Modoc, and Klamath/North Coast bioregions had particulate matter concentrations below the State average. In 1997, only seven of the 24 counties in forest and rangeland bioregions reported particulate matter concentrations higher than the State average. San Luis Obispo had the highest particulate matter concentration of all forest and rangeland counties with $38 \mu\text{g} / \text{m}^3$. Lake County had the lowest particulate matter concentration of all forest and rangeland counties with $9 \mu\text{g} / \text{m}^3$. See [Bioregion and County Particulate Matter Concentrations](#).

Commuting to work

The amount of time spent commuting is another consideration for quality of life, with shorter commute times usually more desirable. Many workers are often faced with long commutes because housing costs are not commensurate with wages in the communities in which they work. Regions with short commutes usually represent those with balanced housing and wage rates and present desirable life style characteristics.

Most forest and rangeland bioregions show a higher percentage of shortest commute times (0-29 minute category) compared to the State averages, and less for the longer commute categories (Table 26). Longer average commute times generally occur where the population has moved out from urban areas at a greater travel distance or where traffic congestion is an issue. For example, Placer County has experienced longer commute times due to population growth and movement away from the city of Sacramento. See [Bioregion and County Commute Times](#).

Table 26. Commute time to work as a percentage of total workers, 1990

Bioregion	0–29 minutes	30–50 minutes	60 minutes or more	Work at home	Total workers
State of California	58	28	10	4	14,525,322
Modoc	78	11	5	6	13,445
Klamath/North Coast	74	14	6	6	141,534
Sierra	60	25	10	6	310,357
Central Coast	67	21	8	4	946,638
Sacramento Valley	67	24	6	4	847,164

Source: U.S. Census, 2002b

Natural amenities scale

The natural amenities scale is a measure of the physical characteristics that enhance the location as a place to live. The index was constructed by combining six measures of climate, topography, and water area that reflect environmental qualities most people prefer. These measures are: warm winters, winter sun, temperate summers, low summer humidity, topographic variation, and water area (McGranahan, 1999). See [Natural Amenity Index](#)

In general, California ranks very high on the natural amenity scale. The scale is constructed so that the average county on a national basis has a score of zero. Those counties with higher deviation from the average have higher scores. No county in California was less than one on the amenity scale. This is likely because of California's desirable climate, varied topography, and many water bodies.

Table 27 shows the average scale score for forest and rangeland bioregions. As shown, the Central Coast and Klamath/North Coast have the highest scale scores in the State. It is important to note, however, that this natural amenity scale is based solely on physical characteristics. As such, Los Angeles and San Francisco counties rank as high as Del Norte County because only physical features are evaluated, and factors such as population levels and human structures (cities) are not part of the evaluation. See [Bioregion and County Amenity Index](#).

Table 27. Natural amenity scale score by forest and rangeland bioregion

Bioregion	Score
Modoc	6
Klamath/North Coast	8
Sacramento Valley	4
Sierra	7
Central Coast	9

Source: McGranahan, 1999

Conclusions

An analysis of 25 different social well being factors has shown forest and rangeland bioregions and counties scoring surprisingly well. In general, most forest and rangeland areas have lower per capita incomes compared with the State average. With the exception of home ownership, most forest and rangeland areas had similar to or lower measures of equity compared with the State average. Forest and

rangeland areas have good school systems, scoring higher than the State average in nearly every measure of investment in education. Forest and rangeland areas also had above average safe and involved communities compared to the State average. Results showed forest and rangeland areas had strong quality of life indicators scoring above average for nearly every measure.

According to these indicators, socio-economic resources in bioregions with substantial amounts of forest and rangeland are diverse. Economic resources are less, poverty is greater, but the lifestyle is relatively good. Resources for education and information technology for students often are above average. Each bioregion has abundant watershed and fire safe groups, as well as ecological restoration projects. However, from this county level analysis it is impossible to say for certain that community involvement is more or less likely since it is typically centered on specific communities.

Glossary

Multi-family housing: housing units including duplexes, three to four unit structures, and apartment type structures with five units or more.

Natural amenities scale: a scale ranking an index of physical attributes that enhanced a location as a place of residence.

Network: A system typically composed of one or more servers and multiple workstations that links computers together.

Ozone (O₃): An unstable, poisonous allotrope of oxygen that is formed naturally from atmospheric oxygen by electric discharge or exposure to ultraviolet radiation. It is also produced in the lower atmosphere by the photochemical reaction of certain pollutants.

Particulate matter: airborne particles ten microns in diameter and smaller.

Per capita income: total personal income divided by number of people.

Personal income: the sum of wage and salary disbursements, transfer payments, proprietors' income, personal interest income, and personal dividend income.

Personal dividend income: includes income people receive from stock holdings and mutual fund shares. It does not include capital gains from the sale of stock holdings as income.

Personal interest income: includes payments people receive (or have credited to accounts) from bonds, treasury notes, IRAs, certificates of deposit, interest-bearing savings and checking accounts, and all other investments that pay interest.

Proprietors' income: proprietors' income includes the imputed net rental income of owner-occupants of farm dwellings, but it excludes the imputed net rental income of owner-occupied non-farm housing as well as the dividends and the monetary interest that are received by non-financial business and the non-farm rental income received by persons not primarily engaged in the real estate business.

SAT: The SAT I Reasoning Test (formerly called Scholastic Aptitude Test), widely used as a college entrance examination. A score can be compared to state and national averages of seniors graduating from any public or private school.

Transfer payments: Income payments to persons for which no current services have been performed. They consist of payments to individuals and to non-profit institutions by businesses and federal, state, and local governments.

Wage and salary disbursements: the total income people receive for work performed as an employee during the income year. This category includes wages, salary, armed forces pay, commissions, tips, piece

rate payments, and cash bonuses earned, before deductions are made for items such as taxes, bonds, pensions, and union dues.

Well being index: a composite of 12 socio-economic indicators expressed as a single average percentage of the statewide average of these same indicators.

Wide area network: A wide area network links computers over a physical distance that is larger than that of a local area network (LAN). A small network serving a collection of computers in the same general location is referred to as a local area network or LAN. If the computers are more dispersed, for example in different buildings around a city or state, the network is referred to as a wide area network or WAN.

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